[6450-01-P]

DEPARTMENT OF ENERGY

Office of Energy Efficiency and Renewable Energy

[Case No. CAC-036]

Decision and Order Granting a Waiver to LG Electronics U.S.A., Inc. from the Department of Energy Commercial Package Air Conditioner and Heat Pump Test Procedures

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Decision and Order.

SUMMARY: This notice publishes the U.S. Department of Energy's (DOE) Decision and Order in Case No. CAC-036, which grants LG Electronics U.S.A., Inc. (LG) a waiver from the existing DOE test procedures applicable to commercial package air-source central air conditioners and heat pumps. The waiver is applicable to the LG Multi V III variable refrigerant flow (VRF) multi-split commercial heat pumps specified in LG's July 22, 2011 petition for waiver. As a condition of this waiver, LG must use the alternate test procedure set forth in this notice to test and rate its Multi V III VRF multi-split commercial heat pumps.

DATES: This Decision and Order is effective **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

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SUPPLEMENTARY INFORMATION: DOE issues notice of this Decision and Order in accordance with Title 10 of the Code of Federal Regulations (10 CFR) 431.401(f)(4). In this Decision and Order, DOE grants LG a waiver from the existing DOE commercial package air conditioner and heat pump test procedures for the basic models of its Multi V III VRF multi-split equipment specified in its July 22, 2011 petition for waiver. DOE also requires the use of AHRI 1230 with Addendum 1 as the alternative test procedure for these basic models.

Today's decision requires LG to make representations concerning the energy efficiency of this equipment consistent with the provisions and restrictions of the alternate test procedure in the Decision and Order below, and the representations must fairly disclose the test results. (42 U.S.C. 6314(d)) The same standard applies to distributors, retailers, and private labelers when making representations of the energy efficiency of this equipment. Id.

Issued in Washington, DC, on December 14, 2011.

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Kathleen B. Hogan
Deputy Assistant Secretary for Energy Efficiency
Energy Efficiency and Renewable Energy

Decision and Order

In the Matter of: LG Electronics U.S.A., Inc. (LG) (Case No. CAC-036).

Background

Title III, Part C of the Energy Policy and Conservation Act of 1975 (EPCA), Pub. L. 94-163 (42 U.S.C. 6311-6317), established the Energy Conservation Program for certain industrial equipment, which includes commercial air conditioning equipment, the focus of this decision and order.[1]

Part C specifically includes definitions (42 U.S.C. 6311), test procedures (42 U.S.C. 6314), labeling provisions (42 U.S.C. 6315), energy conservation standards (42 U.S.C 6313), and the authority to require information and reports from manufacturers (42 U.S.C. 6316). With respect to test procedures, Part C authorizes the Secretary of Energy (the Secretary) to prescribe test procedures that are reasonably designed to produce results that measure energy efficiency, energy use, and estimated annual operating costs, and that are not unduly burdensome to conduct. (42 U.S.C. 6314(a)(2))

For commercial package air-conditioning and heating equipment, EPCA provides that "the test procedures shall be those generally accepted industry testing procedures or rating procedures developed or recognized by the Air-Conditioning and Refrigeration Institute [ARI] or by the American Society of Heating, Refrigerating and Air-Conditioning Engineers [ASHRAE],

1 For editorial reasons, upon codification in the U.S. Code, Part C was re-designated Part A-1.

as referenced in ASHRAE/IES Standard 90.1 and in effect on June 30, 1992." (42 U.S.C. 6314(a)(4)(A)) Under 42 U.S.C. 6314(a)(4)(B), if the industry test procedure for commercial package air-conditioning and heating equipment is amended, EPCA directs the Secretary to amend the corresponding DOE test procedure unless the Secretary determines, by rule and based on clear and convincing evidence, that such a modified test procedure does not meet the statutory criteria set forth in 42 U.S.C. 6314(a)(2) and (3).

On December 8, 2006, DOE published a final rule adopting test procedures for commercial package air-conditioning and heating equipment, effective January 8, 2007. 71 FR 71340. Table 1 to Title 10 of the Code of Federal Regulations (10 CFR) 431.96 directs manufacturers of commercial package air conditioning and heating equipment to use the appropriate procedure when measuring energy efficiency of this equipment. For commercial package air-source equipment with capacities between 65,000 and 760,000 Btu/h, ARI Standard 340/360-2004 is the applicable test procedure.

DOE's regulations for covered products and equipment permit a person to seek a waiver from the test procedure requirements for covered commercial equipment if at least one of the following conditions is met: (1) the petitioner's basic model contains one or more design characteristics that prevent testing according to the prescribed test procedures; or (2) the prescribed test procedures may evaluate the basic model in a manner so unrepresentative of its true energy consumption as to provide materially inaccurate comparative data. 10 CFR 431.401(a)(1). Petitioners must include in their petition any alternate test procedures known to the petitioner to evaluate the basic model in a manner representative of its energy consumption.

10 CFR 431.401(b)(1)(iii). The Assistant Secretary for Energy Efficiency and Renewable Energy (Assistant Secretary) may grant a waiver subject to conditions, including adherence to alternate test procedures. 10 CFR 431.401(f)(4). Waivers remain in effect according to the provisions of 10 CFR 431.401(g).

The waiver process also permits parties submitting a petition for waiver to file an application for interim waiver of the applicable test procedure requirements. 10 CFR 431.401(a)(2). The Assistant Secretary will grant an interim waiver request if it is determined that the applicant will experience economic hardship if the application for interim waiver is denied, if it appears likely that the petition for waiver will be granted, and/or the Assistant Secretary determines that it would be desirable for public policy reasons to grant immediate relief pending a determination on the petition for waiver. 10 CFR 431.401(e)(3). An interim waiver remains in effect for 180 days or until DOE issues its determination on the petition for waiver, whichever occurs first. It may be extended by DOE for an additional 180 days. 10 CFR 431.401(e)(4).

On July 22, 2011, LG filed an application for interim waiver and a petition for waiver from the test procedures under 10 CFR 431.96 that apply to commercial package air source air conditioners and heat pumps. LG's petition requests a waiver from the applicable test procedures for its multi-split models designated Multi V III, with capacities ranging from 69,000 Btu/h to 414,000 Btu/h, as specified in the petition. The applicable test procedure for these heat pumps is ARI 340/360-2004. Manufacturers are directed to use these test procedures pursuant to

Table 1 of 10 CFR 431.96.

LG seeks a waiver from the applicable test procedures under 10 CFR 431.96 on the grounds that its Multi V III multi-split heat pumps contain design characteristics that prevent testing according to the current DOE test procedures. Specifically, LG asserts that the two primary factors that prevent testing of its Multi V III multi-split variable speed equipment are the same factors stated in the waivers that DOE granted to Mitsubishi Electric & Electronics USA, Inc. (Mitsubishi) and other manufacturers for similar lines of commercial multi-split air-conditioning systems:

- Testing laboratories cannot test products with so many indoor units; and
- There are too many possible combinations of indoor and outdoor units to test.

See, e.g., 72 FR 17528 (April 9, 2007) (Mitsubishi); 76 FR 19069 (April 6, 2011) (Daikin); 76 FR 19078 (April 6, 2011) (Mitsubishi); 76 FR 31951 (June 2, 2011) (Carrier); 76 FR 50204 (August 12, 2011) (Fujitsu General Limited); 76 FR 65707 (Oct. 24, 2011) (LG).

On August 30, 2011, DOE published LG's petition for waiver in the Federal Register, seeking public comment pursuant to 10 CFR 431.401(b)(1)(iv), and granted the application for interim waiver. 76 FR 53889. DOE received no comments on LG's petition.

Assertions and Determinations

LG's Petition for Waiver

LG seeks a waiver from the DOE test procedures for this product class on the grounds that its Multi V III VRF multi-split commercial heat pumps contain design characteristics that prevent them from being tested using the current DOE test procedures. LG asserts that the two primary factors that prevent testing of its multi-split variable speed equipment are the same factors stated in the waivers that DOE granted to Mitsubishi, Fujitsu General Ltd. (Fujitsu), Samsung Air Conditioning (Samsung), Daikin, Sanyo, and Carrier for similar lines of commercial multi-split air-conditioning systems: (1) testing laboratories cannot test products with so many indoor units; and (2) there are too many possible combinations of indoor and outdoor unit to test.

The Multi V III systems have operational characteristics similar to the commercial multi-split equipment manufactured by other manufacturers. As indicated above, DOE has already granted waivers for these products. The Multi V III system consists of multiple indoor units connected to an air-source outdoor unit. These multi-splits are used in zoned systems where an outdoor air-source unit can be connected with up to 13 – 61 separate indoor units, which need not be the same models. According to LG, the various indoor and outdoor models can be connected in a multitude of configurations, with many thousands of possible combinations. Consequently, LG requested that DOE grant a waiver from the applicable test procedures for its Multi V III product designs until a suitable test method can be prescribed.

In responses to two petitions for waiver from Mitsubishi for similar equipment, DOE specified an alternate test procedure to provide a basis upon which Mitsubishi could test and make valid energy efficiency representations for its R410A CITY MULTI equipment, as well as

for its R22 multi-split equipment. Alternate test procedures related to the Mitsubishi petitions were published in the Federal Register on April 9, 2007. See 72 FR 17528 and 72 FR 17533. The LG Multi V III VRF systems have operational characteristics similar to the commercial multi-split products manufactured by Mitsubishi, as well as by Samsung, Fujitsu, Daikin, Carrier, and Sanyo. DOE has also granted waivers to these manufacturers. For reasons similar to those published in these prior notices, DOE believes that an alternate test procedure is appropriate in this instance.

After DOE granted a waiver to Mitsubishi's CITY MULTI products, the Air-Conditioning and Refrigeration Institute (ARI) (now AHRI) formed a committee to develop a general testing protocol for VRF systems. The committee developed AHRI 1230, which is referenced in ASHRAE 90.1-2010 as the test procedure for VRF equipment. AHRI 1230 establishes a test procedure for VRF multi-split air conditioners and heat pumps. The test procedure covers matched VRF systems with cooling and heating capacities for outdoor units between 12,000 Btu/h and 300,000 Btu/h. DOE is assessing AHRI 1230 with respect to the requirements EPCA specifies for test procedures, and will make a preliminary determination regarding AHRI 1230 in a future rulemaking.

AHRI 1230 is very similar to the alternate test procedure in the commercial multi-split waivers that DOE previously granted to LG and other manufacturers, but contains minor differences in the definition of tested combination, the testing of ducted versus non-ducted indoor units, and the line lengths. These differences are discussed below.

First, the definition of "tested combination" in AHRI 1230 and the alternate test procedure prescribed by DOE in the earlier multi-split waivers are identical in all relevant respects, except that AHRI 1230 with Addendum 1[2] allows the use of up to 12 indoor units, as opposed to eight in the earlier alternate test procedure.

Second, ANSI/AHRI 1230-2010 requires an additional test. The earlier alternate test procedure provides for efficiency rating of a non-tested combination in one of two ways: (1) at an energy efficiency level determined using a DOE-approved alternative rating method; or (2) at the efficiency level of the tested combination utilizing the same outdoor unit. In AHRI 1230, similar to the residential test procedure set forth in 10 CFR part 430, subpart B, appendix M, multi-split manufacturers must also test two or more combinations of indoor units with each outdoor unit. The first system combination is tested using only non-ducted indoor units that meet the definition of a tested combination. The rating given to any untested multi-split system combination having the same outdoor unit and all non-ducted indoor units is set equal to the rating of the tested system having all non-ducted indoor units. The second system combination is tested using only ducted indoor units that meet the definition of a tested combination. The rating given to any untested multi-split system combination having the same outdoor unit and all ducted indoor units is set equal to the rating of the tested system having all ducted indoor units. The rating given to any untested multi-split system combination having the same outdoor unit and a mix of non-ducted and ducted indoor units is set equal to the average of the ratings for the two required tested combinations.

[2] The revision to the definition of "tested combination" to allow the use of up to 12 indoor units is the only change made by Addendum 1.

Third, the alternate test procedure and AHRI 1230 require the use of different line lengths for the cooling refrigerant line when performing efficiency testing. AHRI 1230 requires longer line lengths depending on the type and capacity of the connected indoor units.

As DOE continues to evaluate AHRI 1230, DOE has granted manufacturers' request to use AHRI 1230 as the alternate test procedure for testing and rating their commercial multi-split products subject to a waiver of DOE's test procedures. DOE prescribed AHRI 1230 as the alternate test procedure for those Daikin AC (Americas) Inc. ("Daikin") commercial multi-split equipment that have cooling capacities less than or equal to 300,000 Btu/h (76 FR 34685, June 14, 2011), for Carrier Corporation's ("Carrier") commercial multi-split equipment (76 FR 31951, June 2, 2011), and for LG's interim waiver in response to the instant petition.

LG's petition requested a waiver for the LG Multi V III VRF multi-split heat pumps with capacities ranging from 69,000 Btu/h to 414,000 Btu/h. LG requested that DOE permit it to use AHRI 1230 as the alternate test procedure to test and rate its Multi V III VRF equipment that have capacities less than or equal to 300,000 Btu/h. AHRI 1230 covers multi-split equipment with cooling and heating capacities for outdoor units from 12,000 Btu/h to 300,000 Btu/h. For those Multi V III VRF products that have capacities greater than 300,000 Btu/h, LG will continue to use the alternate test procedure specified in the earlier waivers.

As discussed above, AHRI 1230 requires longer line lengths for the cooling refrigerant line during testing, depending on the type and capacity of the connected indoor units. This difference affects the resulting energy efficiency determination. Testing according to AHRI

1230's requirements provides a more conservative estimate of energy consumption because it results in a slightly lower efficiency rating than testing according to the alternate test procedure.

In addition, the definition of "tested combination" in AHRI 1230 is more appropriate for these LG products than the definition in the current alternate test procedure. As defined in the current alternate test procedures for LG's products, the "tested combination" of a VRF system is defined as one outdoor unit matched with between two and eight indoor units. The indoor units must represent the highest sales model family, and, together, must have a nominal cooling capacity that is between 95% and 105% of the nominal cooling capacity of the outdoor unit. Due to the relative size of some of LG's outdoor units and indoor units, permitting the matching of up to only eight indoor units may not be sufficient to comply with the requirement that the indoor units must have a combined capacity that is between 95% and 105% of the nominal cooling capacity of the outdoor unit. AHRI 1230, as revised in March 2011, permits the use of up to twelve indoor units. For consistency purposes, DOE also amends the definition of "tested combination" in the current alternate test procedure to make it identical to the definition in AHRI 1230 for those units with capacities greater than 300,000 Btu/h that are outside the scope of AHRI 1230.

For the reasons discussed above, DOE believes LG's Multi V III VRF multi-split heat pumps cannot be tested using the procedure prescribed in 10 CFR 431.96 (ARI Standard 340/360-2004) and incorporated by reference in DOE's regulations at 10 CFR 431.95(b)(2)-(3). After careful consideration, DOE has decided to prescribe ANSI/AHRI 1230-2010 as the alternate test procedure for LG's commercial multi-split products with capacities less than or

equal to 300,000 Btu/h, and the modified alternate test procedure described above for those units with capacities greater than 300,000 Btu/h that are outside the scope of AHRI 1230.

Conclusion

After careful consideration of all the materials submitted by LG, it is ordered that:

(A) LG is required to test the products listed below with cooling capacities of 300,000 Btu/h and less according to the alternate test procedure ANSI/AHRI 1230-2010.

(B) LG shall be required to test the products listed below with cooling capacities above 300,000 Btu/h according to the test procedures for central air conditioners and heat pumps prescribed by DOE at 10 CFR 431.96, except that LG shall test each model of outdoor unit with two or more combinations of indoor units. The first system combination shall be tested using only non-ducted indoor units that meet the definition of a tested combination as set forth in subparagraph (C). The second system combination shall be tested using only ducted indoor units that meet the definition of a tested combination as set forth in subparagraph (C). LG shall make representations concerning the products covered in this waiver according to the provisions of subparagraph (D):

Multi V III Series Air-Source Heat Pumps and Heat Recovery Units:

Rated Cooling Capacity	Model name				
Btu/h	Multi V III Heat Pump 3 phase 208/230 V 60 Hz	Multi V III Heat Recovery 3 phase 208/230 V 60 Hz	Multi V III Heat Pump 3 phase 460 V 60 Hz	Multi V III Heat Recovery 3 phase 460 V 60 Hz	Frame Type
69000	ARUN072BT3	ARUB072BT3	ARUN072DT3	ARUB072DT3	Single
92000	ARUN096BT3	ARUB096BT3	ARUN096DT3	ARUB096DT3	
114000	ARUN121BT3	ARUB121BT3	ARUN121DT3	ARUB121DT3	
138000	ARUN144BT3	ARUB144BT3	ARUN144DT3	ARUB144DT3	
160000	ARUN168BT3	ARUB168BT3	ARUN168DT3	ARUB168DT3	Dual
184000	ARUN192BT3	ARUB192BT3	ARUN192DT3	ARUB192DT3	
206000	ARUN216BT3	ARUB216BT3	ARUN216DT3	ARUB216DT3	
228000	ARUN240BT3	ARUB240BT3	ARUN240DT3	ARUB240DT3	
250000	ARUN264BT3	ARUB264BT3	ARUN264DT3	ARUB264DT3	
274000	ARUN288BT3	ARUB288BT3	ARUN288DT3	ARUB288DT3	
296000	ARUN312BT3	ARUB312BT3	ARUN312DT3	ARUB312DT3	Triple
320000	ARUN336BT3	ARUB336BT3	ARUN336DT3	ARUB336DT3	
342000	ARUN360BT3	ARUB360BT3	ARUN360DT3	ARUB360DT3	
366000	ARUN384BT3	ARUB384BT3	ARUN384DT3	ARUB384DT3	
390000	ARUN408BT3	ARUB408BT3	ARUN408DT3	ARUB408DT3	
414000	ARUN432BT3	ARUB432BT3	ARUN432DT3	ARUB432DT3	

Compatible Indoor Units for the Above-Listed Models
(Shaded Indoor Units Not Previously Listed in DOE Waiver):

Rated Cooling Capacity	Indoor Unit								
	Wall Mounted	Art Cool Mirror	Vertical / Horizontal Air Handler	4 way Cassette		2 Way Cassette	1 Way Cassette	Ceiling Concealed Duct -low static	Ceiling Concealed Duct -Built in
5300					ARNU053TR*2				
7500	ARNU073SEL2	ARNU073SE*2		ARNU073TEC2			ARNU073TJC2	ARNU073B1G2	ARNU073B3G2
9600	ARNU093SEL2	ARNU093SE*2		ARNU093TEC2	ARNU093TN*2		ARNU093TJC2	ARNU093B1G2	ARNU093B3G2
12300	ARNU123SEL2	ARNU123SE*2		ARNU123TEC2	ARNU123TN*2		ARNU123TJC2	ARNU123B1G2	ARNU123B3G2
15400	ARNU153SEL2	ARNU153SE*2		ARNU153TEC2	ARNU153TN*2			ARNU153B1G2	ARNU153B3G2
19100	ARNU183S5L2	ARNU183S5*2	ARNU183NJA2	ARNU183TEC2	ARNU183TM*2	ARNU183TLC2		ARNU183B2G2	ARNU183B4G2
24200	ARNU243S5L2	ARNU243S5*2	ARNU243NJA2	ARNU243TPC2	ARNU243TM*2	ARNU243TLC2		ARNU243B2G2	ARNU243B4G2
28000			ARNU303NJA2	ARNU283TPC2					
36200			ARNU363NJA2	ARNU363TNC2					
42000			ARNU423NKA2	ARNU423TMC2					
48100			ARNU483NKA2	ARNU483TMC2					
54000			ARNU543NKA2						
76400									
95500									

(C) Tested combination. The term ‘‘tested combination’’ means a sample basic model comprised of units that are production units, or are representative of production units, of the basic model being tested. For the purposes of this waiver, the tested combination shall have the following features: The basic model of a variable refrigerant flow system (“VRF system”) used as a tested combination shall consist of an outdoor unit (an outdoor unit can include multiple outdoor units that have been manifolded into a single refrigeration system, with a specific model number) that is matched with between 2 and 12 indoor units; for multi-split systems, each of these indoor units shall be designed for individual operation.

(D) Representations. In making representations about the energy efficiency of its Multi V III VRF multi-split equipment, for compliance, marketing, or other purposes, LG must fairly disclose the results of testing under the DOE test procedure in a manner consistent with the provisions outlined below:

(i) For multi-split combinations tested in accordance with this alternate test procedure, LG may make representations based on those test results.

(ii) For multi-split combinations that are not tested, LG may make representations based on the testing results for the tested combination and that are consistent with one of the following methods:

(a) Rating of non-tested combinations according to an alternative rating method approved by DOE; or

(b) Rating of non-tested combinations having the same outdoor unit and all non-ducted indoor units shall be set equal to the rating of the tested system

having all non-ducted indoor units.

(c) Rating of non-tested combinations having the same outdoor unit and all ducted indoor units shall be set equal to the rating of the tested system having all ducted indoor units. To be considered a ducted unit, the indoor unit must be intended to be connected with ductwork and have a rated external static pressure capability greater than zero (0).

(d) Rating of non-tested combinations having the same outdoor unit and a mix of non-ducted and ducted indoor units shall be set equal to the average of the ratings for the two required tested combinations.

(E) This waiver amendment shall remain in effect from the date this Decision and Order is issued, consistent with the provisions of 10 CFR 431.401(g).

(F) This waiver is issued on the condition that the statements, representations, and documentary materials provided by the petitioner are valid. DOE may revoke or modify the waiver at any time if it determines that the factual basis underlying the petition for waiver is incorrect, or the results from the alternate test procedure are unrepresentative of the basic models' true energy consumption characteristics.

(G) This waiver applies only to those basic models set out in LG's petition for waiver. Grant of this waiver does not release a petitioner from the certification requirements set forth at 10 CFR part 429.

Issued in Washington, DC, on December 14, 2011.

Kathleen B. Hogan
Deputy Assistant Secretary for Energy Efficiency
Energy Efficiency and Renewable Energy

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